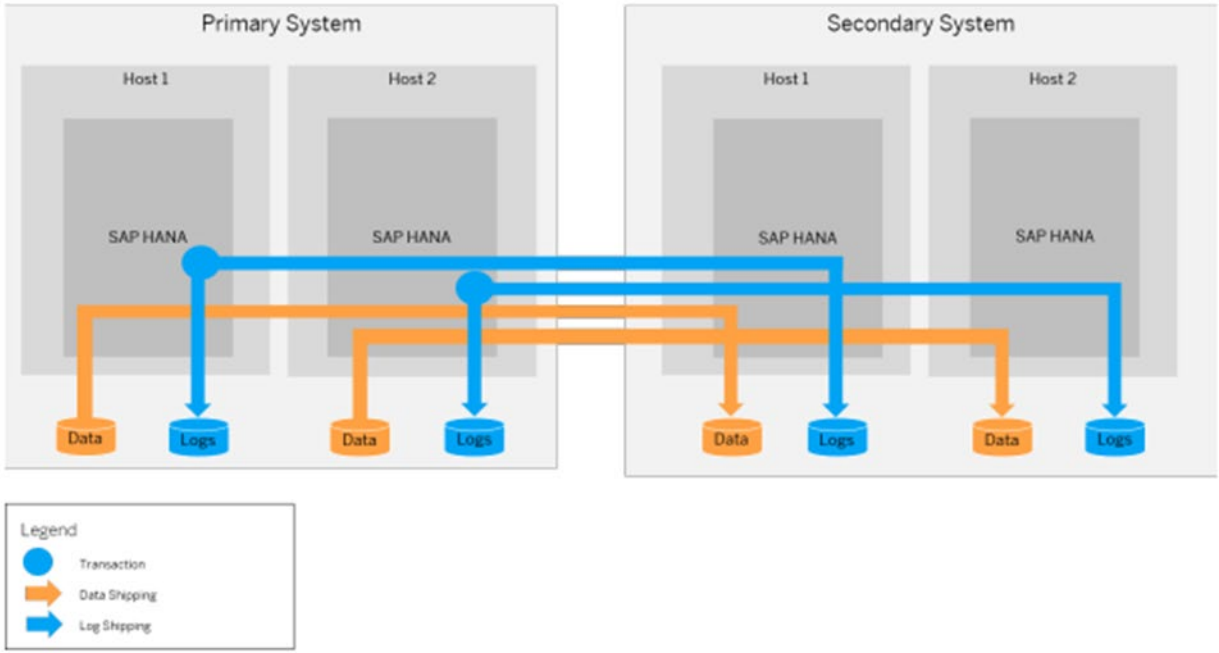
EXHIBIT 12

Exhibit 12: U.S. Patent No. 6,691,139

Claim 1	Identification
1[pre]. A method for creating a standby data processing system located at a standby site, which is remotely located from a primary site, comprising the steps of:	To the extent the preamble is limiting, SAP HANA creates a standby data processing system located at a standby site, which is remotely located from a primary site. For example, *see*: SAP HANA System Replication SAP HANA system replication is a mechanism for ensuring the high availability of your SAP HANA system. Through the continuous replication of data from a primary to a secondary system, including in-memory loading, system replication facilitates rapid failover in the event of a disaster. Productive operations can be resumed with minimal downtime. The following administration activities are possible using the SAP HANA cockpit, using the SAP HANA studio, or using hdbnsutil on the command line: • Performing the initial set-up, that is enabling system replication and establishing the connection between two identical systems • Monitoring the status of system replication to ensure that both systems are in sync • Triggering takeover by the secondary system in the event of a disaster and failback once the original system is available again • Disabling system replication Source: https://help.sap.com/docs/SAP_HANA_PLATFORM/6b94445c94ae495c83a19646e7c3fd56/676844172c2442f0bf6c8b080db05ae7.html System replication is available in every SAP HANA installation offering an inherent disaster recovery support. System replication is set up so that a secondary system is configured as an exact copy of the active primary system, with the same number of active hosts in each system. The number of standby hosts need not be identical. With multitier system replication you can have a third system attached to the first secondary making it a replication chain of three systems. Each service instance of the primary SAP HANA system communicates with a counterpart in the secondary system. With multitarget system replication the primary system can replicate data changes to more than one secondary system. Source: SAP HANA Administration Guide for SAP HANA Platform at 734 (available at https://help.sap.com/doc/eb75509ab0fd1014a2c6ba9b6d252832/2.0.07/en-US/SAP_HANA_Administration_Guide_en.pdf).

Claim 1	Identification
	System replication is SAP's recommended configuration for addressing SAP HANA outage reduction due to planned maintenance, faults, and disasters. It supports a recovery point objective (RPO) of 0 seconds and a recovery time objective (RTO) measured in minutes. System replication is set up so that a secondary system is configured as an exact copy of the active primary system, with the same number of active hosts in each system. The number of standby hosts need not be identical. Furthermore, it requires a reliable link between the primary and secondary systems. Each service of the primary system communicates pairwise with a counterpart in the secondary system. The main difference to the primary system is that the secondary system does not accept requests or queries. The secondary system can accept queries only in an Active/Active (read enabled) configuration. For more information, see *SAP HANA System Replication with Active/Active (Read Enabled)*. The secondary system can be located near the primary system to serve as a rapid failover solution for planned downtime, or to handle storage corruption or other local faults. Alternatively or additionally, a secondary system can be installed in a remote data center for disaster recovery. The instances in the secondary system operate in live replication mode. In this mode all secondary system services constantly communicate with their primary counterparts, replicate and persist data and logs, and typically load data to memory. The log and data can be compressed before shipping. For more information, see *Data and Log Compression*. Source: https://help.sap.com/docs/SAP_HANA_PLATFORM/4e9b18c116aa42fc84c7dbfd02111aba/fb06367a182945eb9048f2b0fb788325.html

Claim 1	Identification
	 Source: https://help.sap.com/docs/SAP_HANA_PLATFORM/4e9b18c116aa42fc84c7dbfd02111aba/fb06367a182945eb9048f2b0fb788325.html
1[a]. computing a difference between an active transaction redo log and an archive transaction redo log to produce a delta image at the primary site;	SAP HANA computes a difference between an active transaction redo log and an archive transaction redo log to produce a delta image at the primary site. For example, *see*:

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	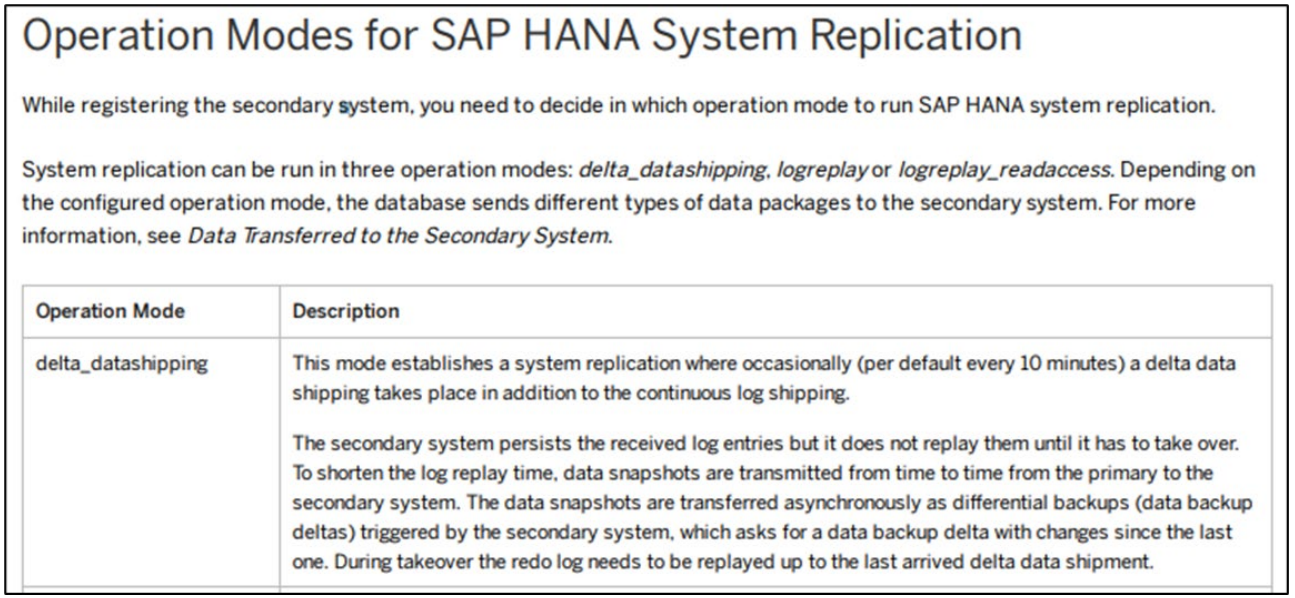

Operation Modes for SAP HANA System Replication

While registering the secondary system, you need to decide in which operation mode to run SAP HANA system replication.

System replication can be run in three operation modes: *delta_datashipping*, *logreplay* or *logreplay_readaccess*. Depending on the configured operation mode, the database sends different types of data packages to the secondary system. For more information, see *Data Transferred to the Secondary System*.

Operation Mode	Description
delta_datashipping	This mode establishes a system replication where occasionally (per default every 10 minutes) a delta data shipping takes place in addition to the continuous log shipping. The secondary system persists the received log entries but it does not replay them until it has to take over. To shorten the log replay time, data snapshots are transmitted from time to time from the primary to the secondary system. The data snapshots are transferred asynchronously as differential backups (data backup deltas) triggered by the secondary system, which asks for a data backup delta with changes since the last one. During takeover the redo log needs to be replayed up to the last arrived delta data shipment.

Source: https://help.sap.com/docs/SAP_HANA_PLATFORM/4e9b18c116aa42fc84c7dbfd02111aba/627bd11e86c84ec2b9fcdf585d24011c.html

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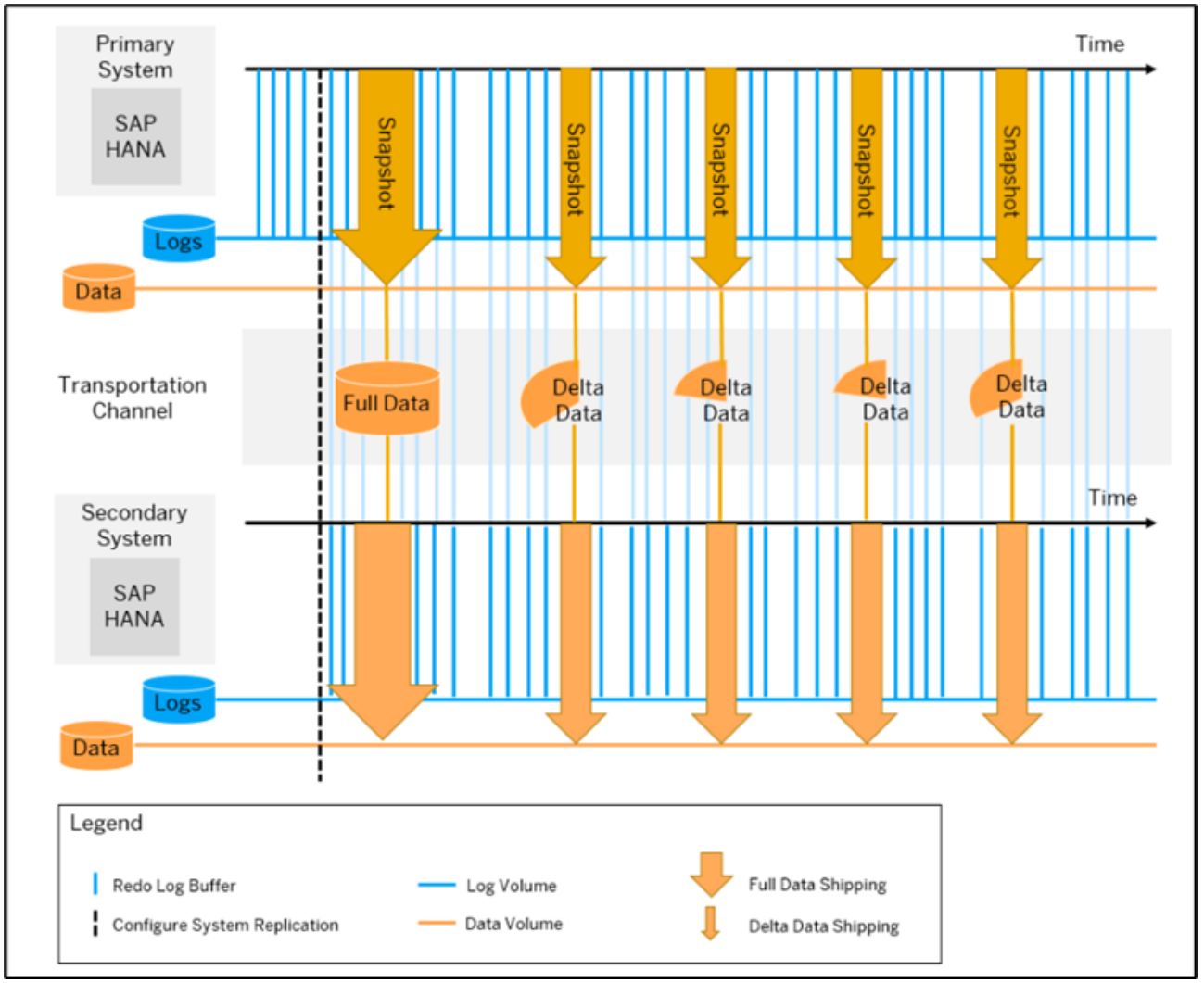
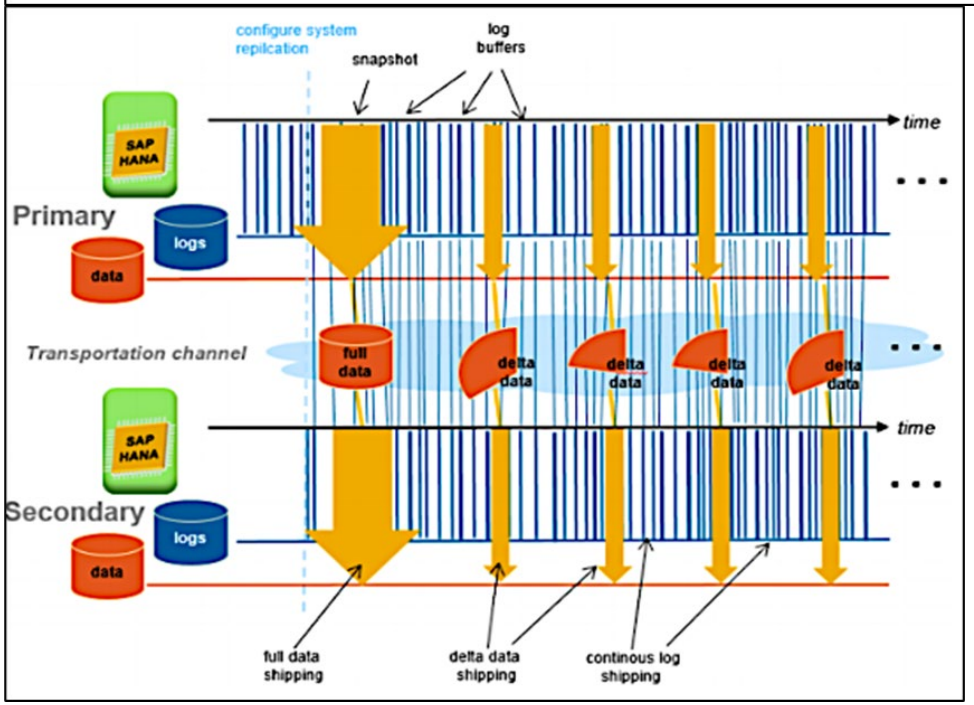
	 Source: https://help.sap.com/docs/SAP_HANA_PLATFORM/4e9b18c116aa42fc84c7dbfd02111aba/dcafdb5742314873b212ebf678d6a96a.html.

Claim 1	Identification
1[b]. transmitting the active transaction redo log and the delta image, separately in time sequence, from the primary site to the standby site; and	SAP HANA transmits the active transaction redo log and the delta image, separately in time sequence, from the primary site to the standby site. For example, *see*: With **delta_datashipping**, the secondary node also receives delta data from time to time (every 10 mins by default) in addition to continuous redo log shipping. In case of a failover, the redo logs just need to be replayed up to the last arrived delta data shipment. And whenever the primary and the secondary nodes are disconnected (due to any reason e.g. network, hardware or service interruption), the replication is basically out of sync and once the services are restored, system replication immediately initiates a delta shipping of the missing data (instead of a full data shipping) to get in sync again which reduces the sync time between primary and secondary hosts.  Source: https://blogs.sap.com/2017/02/28/sap-hana-ha-and-dr-series-6-system-replication-operation-modes-parameters/.

Claim 1	Identification
1[c]. combining the delta image with the active transaction redo log at the standby site, to produce a standby archive transaction redo log.	SAP HANA combines the delta image with the active transaction redo log at the standby site, to produce a standby archive transaction redo log. For example, *see*: **Operation Mode** | **Description** delta_datashipping | This mode establishes a system replication where occasionally (per default every 10 minutes) a delta data shipping takes place in addition to the continuous log shipping. The secondary system persists the received log entries but it does not replay them until it has to take over. To shorten the log replay time, data snapshots are transmitted from time to time from the primary to the secondary system. The data snapshots are transferred asynchronously as differential backups (data backup deltas) triggered by the secondary system, which asks for a data backup delta with changes since the last one. During takeover the redo log needs to be replayed up to the last arrived delta data shipment. Source: https://help.sap.com/docs/SAP_HANA_PLATFORM/4e9b18c116aa42fc84c7dbfd02111aba/627bd11e86c84ec2b9fcdf585d24011c.html.

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	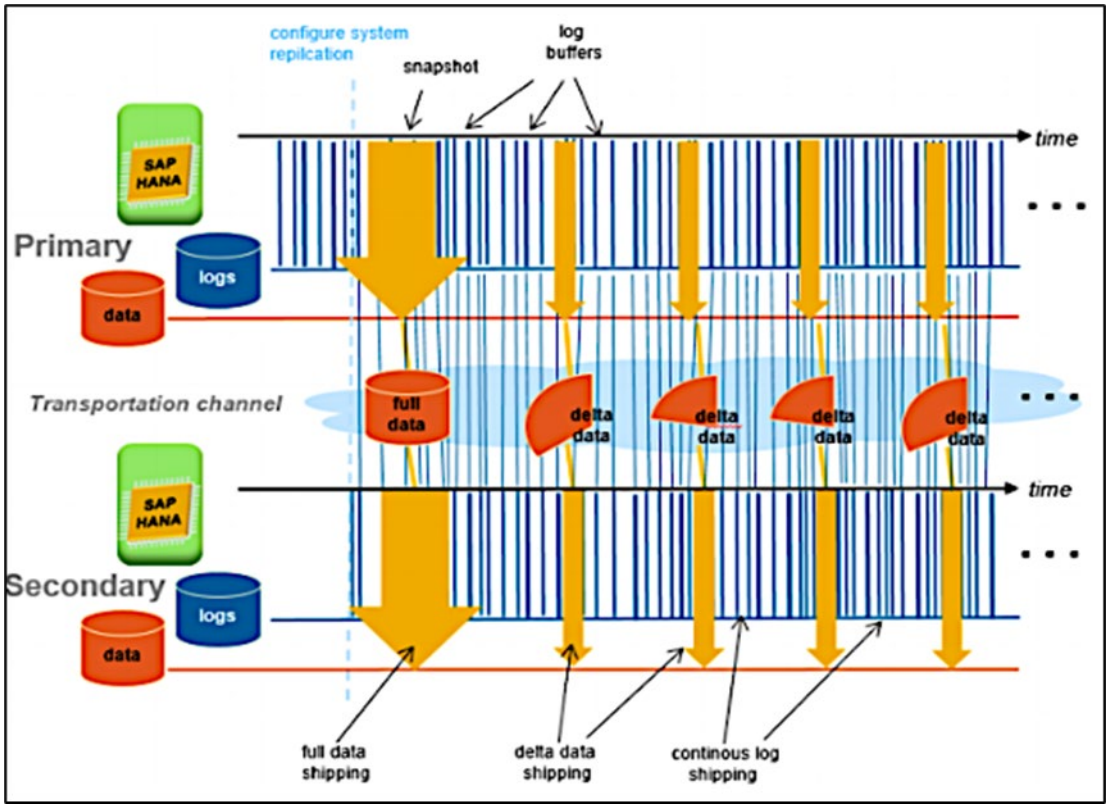 Source: https://blogs.sap.com/2017/02/28/sap-hana-ha-and-dr-series-6-system-replication-operation-modes-parameters/.